Tuthill, Susan Eleanor. The Health Knowledge of Senior Health Education Majors at Selected Universities in North Carolina Offering Degrees in Health Education. (1977) Directed by: Dr. Glen Gordon Gilbert. Pp. 88.

The main purposes of this study were: (1) to determine the number of universities in the United States offering degrees in health education that utilize a standardized health knowledge test and/or equivalent test for their health education majors' health knowledge assessment; and (2) to determine the health knowledge status of senior health education students in selected universities in North Carolina, as determined by the Phillips Health Knowledge Test.

The first purpose was answered by a questionnaire sent to 98 universities offering degrees in health education. From 88 questionnaires returned, only 13.6% of the institutions utilize a standardized health knowledge and/or equivalent test. Three standardized health knowledge tests were identified through the questionnaire:

1. *The Kilander-Leach Health Knowledge Test*
2. *Dearborn College Health Knowledge Test*
3. *Health Science Content Competency Exam*

The second purpose of the study was conducted through the use of a valid and reliable health knowledge instrument (Phillips Health Knowledge Test, 1975), administered to four selected universities in North Carolina offering degrees in health education. The total number of senior health education majors participating in the study was 70. The percentage of correct responses was computed for the total 80 items for each of the ten health topic areas. Comparison of dependent variables were computed by four-way analysis of variance to determine significant differences between universities and within each university.

The results indicated:

1. *A significant difference in health knowledge existed between the four universities.*

2. *A significant difference in health knowledge existed between the four universities in the following health topic areas: Environmental Health, Diseases, Physical Fitness, Family Life, Consumer Health, Drug Education, and Safety Education.*

3. *No significant differences in health knowledge existed between the four universities in the following health topic areas: Nutrition, Community Health, and Mental Health.*

The following recommendations were made:

1. *Students in the field of health education should be tested for their health knowledge through the use of a valid and reliable standardized health knowledge instrument.*

2. *Health knowledge tests should be collected and listed in a bibliography form and kept up to date. They should be made available for universities and colleges which wish to utilize health knowledge instruments for academic or research purposes.*

3. *Standardized health knowledge tests should be devised specifically for health education majors' health knowledge assessment.*

THE HEALTH KNOWLEDGE OF SENIOR HEALTH EDUCATION MAJORS AT SELECTED UNIVERSITIES IN NORTH CAROLINA OFFERING DEGREES IN HEALTH EDUCATION

by

Susan Eleanor Tuthill

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Thesis Adviser

APPROVAL PAGE

This thesis has been approved by the following committee of the Faculty of the Graduate School at the University of North Carolina at Greensboro.

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Date of Acceptance by Committee

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CHAPTER I

INTRODUCTION

One of the primary objectives of health education is to meet the current and future health needs of students. There is a need to prepare each student for change and to enhance his awareness and perception of new ideas. Future health educators are equally in need of such preparation.

Dr. Edward Johns, Professor Emeritus at the University of California in Los Angeles, in an article entitled, "Effective Health Teaching," states thirteen guidelines for effective health instruction. In these guidelines, Dr. Johns stresses the importance of understanding and acquiring adequate knowledge of the health needs and problems of today's college student.

In apparent agreement with Dr. Johns, Dr. Delbert Oberteuffer, former editor of the Journal of School Health, (1968), states:

> Let's keep our classes student-oriented in terms of their problems, their needs, and their approach. I hope we never presume to know what students ought to know unless we can prove that what we teach is what they really need to cope with in their world (Vol. 38, p. 76).

Identification of the problems and needs of university and college students is one of the means of attaining the established goal of health education. Dr. Jesse K. Rash (1955) stated:

> If a health education curriculum is to function to attain the established goals of health education, 'intelligent self direction of health behavior,' education must have a means of identifying the needs of college and university students (p. 135).

Through this goal a health education curriculum can function properly. The President's Commission (1974) also emphasized the health education needs of college students, as stated below:

> Our colleges and universities are doing far less than they might to dispel the ignorance that lies at the root of the ill health of many of our people. Almost all our colleges, it is true, offer many courses that touch in some degree on the principles and practices of healthful living. But these courses are scattered through a number of departments, and the information that is obtained in them is never brought to bear on the practical problems of personal and community health (p. 101).

There have been published research studies concerning identified health education needs of college students. Examples of these instruments can be found in an annotated bibliography listing 75 evaluation instruments in health education since 1949, compiled by Dr. Marian K. Solleder. Tests such as these are designed to measure health knowledge of college students in determining the need for required health instruction at college and university level. Results of the test scores help guide the instruction in the selection of aims, objectives, or desired pupil outcomes as they relate to health information and the needs of students. The students also benefit from the test scores, by allowing them to gain insignt into their assessment of health knowledge achievement.

Students majoring in health education programs should also be tested in the health knowledge area. Health knowledge is one of the basic components of a health education curriculum. Through the use of health knowledge assessment techniques for health education majors, potential strengths

and weaknesses of the curriculum program may be detected. In addition, the student will possibly better understand his or her health knowledge achievement.

PURPOSES OF THE STUDY

Health educators need to measure the health knowledge of students in the field of health education. This will further the professionals' understanding of the student's health needs and permit the student to attain an awareness of his or her progress in health knowledge. The purposes of the study were to:

1. collect information from universities and colleges in the United States offering degrees in health education concerning how they assess the knowledge level of their health education majors.

2. measure the health knowledge of senior students in the field of health education from selected universities in North Carolina.

QUESTIONS TO BE ANSWERED

1. How many colleges and universities currently utilize a standardized health knowledge test for assessment of their health education majors?

2. How many colleges and universities currently utilize a health knowledge test which might be employed as an assessment of their health education majors' health knowledge?

3. What are the health knowledge tests that are currently being employed by colleges and universities in the United States offering degrees in health education?

4. What is the status of the health knowledge of senior health education majors in North Carolina as determined by a valid and reliable standardized test of health knowledge?

BASIC ASSUMPTIONS

1. The students participating in the standardized health knowledge test will answer the questions to the best of their ability.

2. The sample of university administrators at universities in the United States offering degrees in health education will be willing to share their health knowledge tests with the researcher.

SCOPE OF THE STUDY

The study was limited to senior college students majoring in health education at the selected universities in North Carolina offering degrees in health education.

USE OF TERMS AND DEFINITIONS

1. Health Knowledge. Correct responses to questions on issues deemed important by various recognized authorities in health education (Maughan, 1970, p.8).

2. General Health Areas. General Health Areas are the broad areas of health education subject matter which encompass specific health items of the same general topic (Bjerke, 1966, p. 3).

3. Health Knowledge Test. The Health Knowledge Test is a list of questions under general health areas, for the purpose of estimating the health knowledge of the person completing it (Bjerke, 1966, p. 3).

NEED FOR THE STUDY

A need exists for determining the health knowledge of students in the field of health education. Because health knowledge is one of the basic components of a health education program, an accurate assessment of the health knowledge of the students in health education can assist in the development of a curriculum accompanied by meaningful behavioral objectives. This assessment of the students' health knowledge serves the following purposes:

1. It assists the instructor in knowing where emphasis is needed in a health education program.

2. It helps to indicate the strengths and weaknesses in teaching procedures.

3. It aids the students by assisting them in estimating their own progress with regard to health knowledge.

SUMMARY

Chapter I presented an introduction to the area under investigation, the purpose of the study, questions to be answered, basic assumptions, scope of the study, terms and definitions, and the need for the study. Chapter II will review research related to basic health knowledge assessment among colleges and universities completed in the last 25 years.

CHAPTER II

REVIEW OF LITERATURE

The purpose of this chapter is (1) to review the literature related to basic health knowledge assessment among college and university students since 1949, and (2) to review the completed research in standardized testing of health knowledge with students majoring in health education.

HEALTH KNOWLEDGE INSTRUMENTS DEVELOPED FOR COLLEGES AND UNIVERSITIES

The majority of studies regarding the development of evaluation instruments in health education have been compiled into an annotated bibliography, "A Bibliography of Tests of Knowledge, Attitudes, and Behavior, For Elementary, Secondary, and College Levels" (Solleder, 1965). The author of this bibliography, Dr. Marian K. Solleder, was also consulted regarding health knowledge tests developed since 1965. Of the 78 evaluation instruments developed since 1949, four are health knowledge tests constructed for college and university students.

Additional instruments developed beyond 1965 were listed in Health Education Completed Research (Beyrer, 1974) and identified from a questionnaire given to colleges and universities in the United States offering degrees in health education. The questionnaire requested information

regarding the use and knowledge of standardized health knowledge tests. This questionnaire will be described fully in Chapter III.

The following health knowledge tests designed since 1949 for senior high school and/or college students are representative of those found in a review of literature. The included content areas for each instrument are reported in Table I.

Fast-Tyson Health Knowledge Test
(Fast-Tyson, 1975 Revision)

The purpose of the Fast-Tyson Health Knowledge Test, developed by Dr. Charles G. Fast and Mr. Harry L. Tyson, was to measure students' health knowledge at the high school, college, and the university levels. The test contained 100 multiple choice questions in ten major health areas.

The questions on the test were selected from 850 questions given to 12,000 high school seniors and college freshmen completing a basic health course. From 1969 to 1974, norms were developed for the test on more than 5,000 individual scores from students living in 12 states: California, Florida, Indiana, Illinois, Iowa, Massachusetts, Michigan, Missouri, New Jersey, New York, Pennsylvania, and Ohio. The results were as follows:

TABLE I

REVIEW OF CONTENT AREAS

HEALTH TOPIC AREAS	Fast-Tyson	Phillips	Kilander-Leach	Maughan	Bush	Madison	Dearborn	Bridges
Community Health		X	X	X	X	X		X
Consumer Health	X	X		X		X		
Contemporary Health Problems	X							X
Diseases	X	X	X	X	X	X	X	
Drug Education	X	X		X	X	X		X
Environmental Health						X	X	
First Aid	X		X			X		
Health Careers		X						X
Home Nursing								X
Medical Quackery				X			X	
Mental Health	X	X	X	X	X	X	X	X

TABLE I - continued REVIEW OF CONTENT AREAS

HEALTH TOPIC AREAS	Fast-Tyson	Phillips	Kilander-Leach	Maughan	Bush	Madison	Dearborn	Bridges
Nutrition and Diet	X	X	X	X	X	X	X	X
Personal Health	X		X	X	X	X		X
Physical Fitness	X	X				X	X	X
Safety Education	X	X	X					
Sanitation			X				X	
Sense Organs							X	X
Sex and Family Life	X	X	X	X	X	X	X	X

	High School Seniors	University Freshmen
Range of Scores	33-74	33-84
Mean	53.9	63.6
Median	52	59
Mode	44	63, 62, 61, 60, 51, 50, 49, 48, 47, 46
Reliability Coefficient (Kuder-Richardson formula)	.70	.73

Phillips Health Knowledge Test
(Phillips, 1974)

The development of a standardized personal health knowledge test, completed by Dr. Donavan Phillips in 1974, established norms for college students in the state of Oregon. The Phillips test could be used as a pre-test, post-test, or final examination in college personal health classes. Ten health topic areas were used in the test.

From 19 state supported colleges and universities within the state of Oregon, a population of 1,281 students was tested. The results were as stated below (Phillips, 1975, p. 63):

Number of Students	1,281
Number of Questions	80
Mean	49.049
Median	49
Mode	51
Range	13 to 74
Standard Deviation	10.33
Reliability of Test (Kuder-Richardson formula 20)	.852

Kilander-Leach Health Knowledge Test
(Kilander-Leach, 1972)

H. Frederick Kilander first developed the test in 1936. It was revised by Glenn C. Leach in 1972. The instrument consists of 100 multiple choice items covering nine areas of health.

The test was designed to measure the health knowledge of high school students, college freshmen, sophomores, juniors, and seniors. Statistical validity for the test was not computed, but the test questions were devised so that a score of 75 or better could be obtained by the majority of students on the completion of college health courses.

A reliability coefficient of .80 $\pm$ .01 was determined for the college freshmen and a coefficient of .83 $\pm$ .01 for the high school seniors. Reliability was determined by the split-halves method and the Spearman-Brown formula.

Health Knowledge Inventory
(Maughan, 1970)

A health knowledge survey consisting of 40 questions was given to sophomore classes at two universities by Richard L. Maughan in his study, "A Comparative Survey of Health Knowledge Between Sophomores at Utah State University and sophomores at the University of Utah" (Maughan, 1970). The health knowledge test covers ten areas.

Of the 250 students who received the questionnaire by mail, 218 responded. The responses were recorded and the mean scores were

divided according to subject areas and both institutions, the University of Utah (U of U) and Utah State University (USU), as listed below:

Health Area	Number of Questions	Mean Scores USU	Mean Scores U of U
Alcohol and Tobacco	2	44.83	50.00
Community Health and Communicable Diseases	5	62.92	59.41
Consumer Health	5	52.76	50.79
Drugs and Narcotics	5	60.78	65.55
Food Fads and Medical Quackery	5	48.54	60.40
Mental Health	5	53.10	51.00
Personal Health	6	40.09	43.14
Sex Education	7	50.10	52.40

By computation of student "t" scores, students at the University of Utah displayed superior health knowledge at the .05 level of significance based on the one-tailed test.

Maughan concluded that since the University of Utah required a basic health education course for freshmen and the Utah State University did not offer such a course, recommendations were needed for a required class in Basic Health Education to be included in the curriculum of Utah State University.

A Multidimensional Instrument to Identify Health Education Needs (Lussier, 1970)

A multidimensional instrument to identify health education needs for college students was devised by Dr. Richard Lussier in 1970. The instrument contains a health attitude inventory, a health behavior inventory, and a health knowledge test, consisting of 37 questions in health topic areas. The procedures employed in the study were:

1. *Identification of the known college student health needs.*
2. *Construction of an item pool based on the data collected from previous research.*
3. *Development and administration of a multidimensional trial instrument, analysis of data to determine reliability and validity.*
4. *Development of a final instrument.*

The Spearman-Brown Prophecy Formula and the standard error of measurement were completed for each topic area of the instrument. The results of the health knowledge test questions were as stated below:

Mean	*15.0*
Standard Deviation	*3.91*
Reliability Coefficient	*.89*

Bush Health Analogies Test (Bush, Copyright 1969)

This college health analogies test, developed by Herman Spencer Bush, and copyrighted in 1969, was designed as a pre-test for basic college health

courses. The test is comprised of seven areas of health.

Three preliminary test forms containing 100 items were administered in four institutions of higher education in the state of Kentucky, with a total of 2,105 students. The norms for the final test were based upon 2,226 scores.

The test results were as follows:

Test Mean	64. 94
Range	16 to 96
Standard Deviation	15. 41
Reliability Coefficient (Kuder-Richardson formula 20)	.92
Spearman-Brown Reliability Coefficient	.91

Madison Health Knowledge Test
(Crawford, 1964)

The Madison Health Knowledge Test, designed by Dr. Marilyn Crawford in 1964, is used as "(1) a diagnostic test to be given at the beginning of a general health education course, and (2) a basis on which exemption from the course may be answered" (Crawford, 1964, p. 2).

The test consists of 100 multiple choice questions covering 11 health areas. The test was administered to 400 students consisting mainly of freshmen females from Madison College and nine other colleges and universities in Virginia, completing a total of 1,604 test results.

Those results were as follows:

Mean Score	42.10
Median Score	42.01
Standard Deviation	9.42
Reliability Coefficient (Odd-Even Split Half Method, Spearman-Brown formula)	.70

The reason the correlation coefficient was not high, according to Dr. Crawford (1964, p. 2),

> may be explained partially by the method by which the questions in the test were arranged. Test items have been arranged to increasing difficulty within each area. (Areas are arranged in order to facilitate hand scoring when using a three column answer sheet; the last question in each column corresponds with the last question in an area in the test.)

College Health Knowledge Test
(Dearborn, 1959)

In 1959, Mr. Terry Dearborn developed an instrument designed for high school students and adult classes. The instrument is used in determining the various kinds of health information that students acquire upon entering college. The author indicated the test may also be used in measuring students' knowledge achievement in college personal health courses. The instrument consists of 100 questions in 11 areas of health.

The test assisted in detecting the health knowledge and misconceptions obtained by students. Student scores from this test were correlated with the final grades to obtain the coefficient of correlation, .75, found for the test. Dearborn used eight specialists in health education and nine other

persons from the fields of medicine, measurement, and other closely related areas to secure the validity of the test. The split-halves method and the Spearman-Brown formula with correction were used, with a reliability coefficient of .89 determined for the test.

Health Knowledge Test for College Freshmen
(Bridges, 1956)

Frank Bridges, in 1956, designed this test consisting of 100 multiple choice questions measuring health knowledge in 13 areas.

The test was given to over 3,000 college freshmen from 17 states. Based on 1,077 test scores, the results were as stated below:

Range (percent ranking)	06% - 90%
Mean Difficulty of Items	51.65
Median (percent ranking)	50.
Test Reliability (Spearman-Brown formula)	.833

TESTING OF HEALTH KNOWLEDGE WITH STUDENTS MAJORING IN HEALTH EDUCATION

Thorough examination, including the use of the North Carolina Science Technology Research Center, the ERIC System, has revealed a limited amount of research completed in health knowledge assessment of students majoring in health education. A limited number of studies were located by the author using a questionnaire to colleges and universities in the United States offering degrees in health education. This questionnaire will be

discussed later in Chapter III. The researcher was unable to receive permission for further investigation of these studies. Therefore, only one study could be reviewed. This study was identified by the researcher in the Journal of Health Education (1976).

In the fall of 1975 this study was initiated to examine the number of health educators involved in competency based education and the extent of their involvement.

> Competency Based Education is a program which students are required to exhibit certain generic "commons" and/or content-related abilities in order to successfully complete a single course or broader program of study (Pigg, July 1976, p. 15).

A list of 178 institutions offering programs in health education was compiled from the "AAHE Directory of Institutions Offering Specialization in Health Education" (Kirk, Sept./Oct. 1974, pp. 25-31) and A National Directory of College and University School and Public Health Educators (Wrestler, 1975). A total of 157 responded to the questionnaire. The results revealed (1) 61 schools not planning to operate any competency based programs, (2) 39 schools had not but were planning to, and (3) 45 schools had been operating such a program.

The institutions planning competency based programs were asked if they were utilizing competency based education materials from the American Association of Colleges for Teacher Education (AACTE) in planning for their health education programs. Of the 78 responses, 26 institutions indicated utilizing AACTE materials, while 52 reported that they had not.

The author concluded from the results of the survey:

> Apparently there is a lack of consensus among health educators as to what actually constitutes competency based health education (Pigg, July/August, 1976, p. 16).
>
> Since the beginning of the competency based education movement, the AACTE has been recognized as a source of leadership in the area. It is somewhat surprising that health educators have not utilized AACTE materials more extensively (Pigg, July/August, 1976, p. 16).

SUMMARY

This chapter has presented studies regarding health evaluation instruments for the last 24 years. General health knowledge tests designed for college students are few in number. Most of the health knowledge tests are designed for specific health topic areas, such as drug knowledge, sex knowledge, nutritional information, and general disease knowledge. Most of the college health knowledge tests available for evaluation purposes have become dated, with few periodic revisions made to include current health concerns and interests.

Chapter III will describe the procedures used in gathering the data for this study.

CHAPTER III

METHOD OF STUDY

The areas of investigation in this study posed four major questions to be answered. These were:

1. How many colleges and universities in the United States offering degrees in health education utilize a standardized health knowledge test for their health education majors' health knowledge assessment?
2. How many colleges and universities currently utilize a test which might be employed as an assessment of their health education majors?
3. What are the health knowledge tests that are currently being employed by colleges and universities in the United States offering degrees in health education?
4. What is the status of the health knowledge of senior students in North Carolina in the field of health education as determined by a valid and reliable standardized test of health knowledge?

To answer the questions posed in the study, four major procedures were necessary:

1. to formulate the questionnaires needed for the study;
2. to identify the sample population;

3. to send the questionnaires to the schools comprising the sample population; and

4. to analyze the obtained information.

DETERMINING THE NUMBER OF COLLEGES AND UNIVERSITIES IN THE UNITED STATES OFFERING DEGREES IN HEALTH EDUCATION THAT UTILIZE A STANDARDIZED HEALTH KNOWLEDGE TEST

Questionnaire Development

The information required for determining the number of colleges and universities in the United States offering degrees in health education that utilize a standardized health knowledge test or equivalent test was obtained by sending out a compiled questionnaire regarding:

1. the health knowledge assessment technique of the school's health education majors;

2. the utilization of a standardized health knowledge test in regard to assessing the school's health education majors' health knowledge;

3. the utilization of a non-standardized test which might be employed as an assessment tool for the school's health education majors' health knowledge.

Identification of Sample Population

Colleges and universities in the United States offering degrees in health education were selected from A National Directory of College and University

School and Public Health Educators (Wrestler, 3rd edition, 1975). Ninety-eight colleges and universities offering degrees in health education were selected from this directory. This represented the total population of institutions offering degrees in health education according to the directory mentioned above.

Method of Obtaining Information

On September 7, 1976, a questionnaire was sent to the health education program directors in the 98 selected colleges and universities in the United States offering degrees in health education. The directors or chairpersons at these institutions received a letter of introduction (see Appendix A) explaining the purpose of the questionnaire. In addition, they received a self-addressed post card containing the questions for the study (see Appendix A). Approximately five minutes were required for completion of the questionnaire. This brevity was to insure a greater number of responses.

> Often at this stage, the total amount of time required of the respondent may be greatly reduced by asking only for absolutely essential information (Helmstadter, 1970, p. 332).

Analysis of Information

Question number one in the questionnaire was: "Do you currently utilize a standardized health knowledge test for assessment of your health education majors? If so, what is the title and where can it be obtained?"

For question number one, the number of times universities stated that they were currently utilizing a health knowledge test was totaled and recorded.

In addition, the name of the standardized health knowledge test was also listed.

Question number two in the questionnaire was: "Do you have any available tests which might be employed as an assessment of health education majors? If so, what is the title and would you be willing to share it with me?"

The number of times the universities responded "Yes" and "No" was totaled and recorded. Universities responding "Yes" to this question also listed the name of the available test and whether they were willing to distribute the instrument to other schools.

HEALTH KNOWLEDGE OF SENIOR HEALTH EDUCATION MAJORS

Information Required

The health knowledge of the senior health education majors in selected universities in North Carolina was determined from the results of a standardized health knowledge test.

Source of Information

The source of the information collected was senior health education majors from the universities in North Carolina that offer degrees in health education. These institutions were:

Appalachian State University

East Carolina University

North Carolina Central University

University of North Carolina at Greensboro

Western Carolina University.

Western Carolina University had only one senior health education major at the time of the study and was omitted from the study.

The questionnaire and review of literature that was conducted identified health knowledge instruments devised since 1949. Of these health knowledge instruments, nine of the most recent tests were reviewed for the study. This was the total number of tests known to the author which were developed since 1964.

A letter was written to each of the nine authors explaining the study and requesting a copy of his test with information concerning the test (see Appendix A). Of the nine authors:

1. *three authors responded with a copy of their health knowledge tests and information concerning the tests;*
2. *one author responded that the health knowledge instrument was not yet completed, but made reference to another author who had developed a health knowledge test;*
3. *four of the authors never responded; (A second letter was sent to each of these authors and again, no response. However,*

the researcher was able to send for two of the studies containing the test instruments.)

4. one author responded, explaining that the test instrument he devised was not a comprehensive health knowledge test suitable for the study.

From the nine health knowledge instruments, four of the most recent health knowledge tests were then reviewed by a panel of the best available experts from the fields of physical and health education. The tests which were reviewed are as follows:

1. the Kilander Health Knowledge Test;
2. the Madison Health Knowledge Test;
3. the Phillips Health Knowledge Test; and
4. the Health Knowledge Test by Richard L. Maughan.

The seven experts utilized in the instrument review were:

1. Dr. Pearl Berlin, Professor/Coordinator, Graduate Division of Health, Physical Education, and Recreation, U.N.C.-G.
2. Dr. Glen Gilbert, Assistant Professor, Health Education, U.N.C.-G.
3. Ms. Karen King, Instructor, Health Education, U.N.C.-G.
4. Dr. Rosemary McGee, Professor of Physical Education, U.N.C.-G.
5. Dr. Todd Mommsen, Assistant Professor, Health Education, U.N.C.-G.
6. Dr. Marian Solleder, Professor/Coordinator, Health Education Division, U.N.C.-G.
7. Dr. Raymond Vincent, Associate Professor, Health Education, U.N.C.-G.

A brief letter explaining the need for a valid and reliable health knowledge instrument, a copy of each test, and information concerning each test was submitted to each of the faculty members reviewing the test instruments. A separate questionnaire concerning the test choice was included for each faculty member (see Appendix A). The results indicated that six of the seven members selected the Phillips Health Knowledge Test as the most valid and reliable health knowledge instrument.

As shown in Table II, the instruments were ranked in order according to the experts' choice of test to be used for the study.

TABLE II

RANK OF THE HEALTH KNOWLEDGE TESTS BY EXPERTS*

	Experts						
Test	1	2	3	4	5	6	7
Kilander Health Knowledge Test	1	2	2.5	2	2	2	2
Madison Health Knowledge Test	3	3	4	3	3	3	4
Phillips Health Knowledge Test	2	1	1	1	1	1	1
Health Knowledge Test by Richard L. Maughan	4	4	2.5	4	4	4	3

*The highest ranking is given the value of 1.

The criteria as stated by the experts were as follows:

1. Publication date of test.
2. Content areas covered.
3. Appropriate statistical analysis.

Additional reasons were also given by the seven experts concerning their choice of the Phillips Health Knowledge Test as follows:

1. Most recently published of the four.
2. Greatest diversity of content areas.
3. Number of questions being large enough to adequately evaluate health knowledge.
4. Ease in administration of the test.

The Phillips Health Knowledge Test (Phillips, 1975), a standardized health knowledge instrument with 80 questions encompassing ten health topic areas, was developed by Dr. Donavan Phillips, as discussed in Chapter II. The following is the summary statistical information:

Standard Deviation	10.33
Reliability of Test (Kuder-Richardson formula 20)	.852

Complete test results, norms of the test, and topic areas are available in Appendix B.

A letter was written to Dr. Phillips requesting permission to use his health knowledge test. Dr. Phillips promptly replied, granting permission for utilization of the instrument (see Appendix A).

A letter of introduction, explanation of the study, and request for cooperation in the study was sent to each institution in North Carolina offering an undergraduate degree in health education (see Appendix A). Each institution promptly replied, with testing dates listed for their health education seniors. With each health education department's permission, the Phillips Health Knowledge Test was administered to the senior health education majors at the four selected universities in North Carolina offering degrees in health education. Table III contains the names of the institutions, number of senior health education majors at the particular univeristy, number of senior health education majors that were tested by the researcher, and the dates on which the tests were administered.

The total number of senior health education majors participating in the study was 84. Because of the difficulty in arranging for a convenient time for all subjects to meet at each institution, different testing dates had to be arranged. At two of the institutions, it was impossible to arrange for all the seniors in health education to meet at one time for the test; therefore, a professor at each of the two universitites agreed to assist the researcher with the testing procedures. Copies of the Phillips Health Knowledge Test, computer answer sheets, and instructions were given to the assisting professors. All tests were completed and returned to the investigator. Approximaterly 15 minutes were spent on completing the demographic information, which was required before starting the test (see Appendix C). One hour was allowed for completion of the health knowledge test.

TABLE III

TESTING DATES AND SUMMARY INFORMATION OF UNIVERSITIES PARTICIPATING IN THE STUDY

Institution*	Number of Seniors	Number of Seniors Tested	Testing Dates
A	28	28	12/7/76 3/15/77 3/17/77 3/20/77
B	24	18	2/17/77 3/17/77
C	10	10	2/21/77
D	20	14	2/25/77 3/17/77

*Institutions will be identified by letter to assure anonymity.

Analysis of Data

The number of correct and incorrect responses was computed for all 80 items, for each of the ten health topic areas, and for each individual item. The means were computed for each group's score for a comparison of schools. An analysis of variance was also computed to determine if there was a significant difference between the group means. Schools were labeled A, B, C, and D for the purpose of keeping institutions and their results anonymous. Each institution received the scores of its students and percentage of correct and incorrect responses for the total 80 items, for each of the ten health topic areas, and for each individual item.

SUMMARY

Chapter III has presented the questions to be answered, the sub-problems, the procedures by which the information was obtained, and the analysis of the obtained information.

Chapter IV will analyze and present the findings of the study.

CHAPTER IV

DATA AND ANALYSIS

This chapter presents the data collected in the study. The data are presented in the following order: (1) the data pertaining to the sample of universities utilizing standardized health knowledge instruments, (2) the data pertaining to the sample of universities utilizing non-standardized health knowledge instruments, (3) the data pertaining to the health knowledge tests currently being utilized by the sample of colleges and universities, and (4) the data pertaining to the status of the health knowledge of senior students in North Carolina in the field of health education.

PRESENTATION AND DISCUSSION OF QUESTIONNAIRE

The following section will present the data pertaining to the questionnaires received from universities in the United States offering degrees in health education. The data were collected to answer the following three questions:

1. How many colleges and universities currently utilize a standardized health knowledge test for assessment of their health education majors?
2. How many colleges and universities currently utilize a test which might be employed as an assessment of their health education majors?

3. What are the health knowledge tests that are currently being employed by colleges and universities in the United States offering degrees in health education?

Questions one, two, and three were answered by collecting information on a completed questionnaire received from universities in the United States offering degrees in health education, as identified by A National Directory of College and University School and Public Health Educators (Wrestler, 1975). From the 98 questionnaires sent to these colleges and universities, 88 were completed and returned to the researcher. For each question, the results were as follows.

Questionnaire Item Number One

"Do you currently utilize a standardized health knowledge test for assessment of your health education majors? If so, what is the title and where can it be obtained?"

The results indicated that: (1) 83 colleges and universities do not currently utilize a standardized health knowledge test for assessment of their health education majors, and (2) five institutions do utilize a standardized health knowledge test for assessment of their health education majors. Of these five institutions, three stated that the standardized health knowledge instrument utilized was the Kilander-Leach Health Knowledge Test (Kilander-Leach, 1972). Two institutions indicated that they had been utilizing the Dearborn College Health Knowledge Test (Dearborn, 1959).

One of these same universities indicated utilizing another standardized health knowledge instrument, the Health Science Content Competency Exam, but was not willing to allow use of this exam.

Questionnaire Item Number Two

"Do you have any available tests which might be employed as an assessment of health education majors? If so, what is the title and would you be willing to share it with me?"

The results of question number two indicated that: (1) 83 colleges and universities do not currently utilize any available test which might be employed as an assessment of their health education majors, and (2) five institutions utilize a test which could be considered equivalent to a standardized health knowledge instrument. Two of the five universities listed the names of the health knowledge tests, as stated below:

1. A Diagnostic Evaluation of Ingression into the Medical Care Delivery System by Demetri T. Vacalis, 1973.
2. Ruhansions Health Inventory, with two modifications. These modifications included two and/or three other test items by selecting questions from different personal health instructors' manuals.

Two of the five universities would not list their instrument utilized, nor grant permission for its use. One university had developed an instrument for health knowledge, but the test was not yet printed or copyrighted.

PRESENTATION AND DISCUSSION OF DEMOGRAPHIC DATA OF SAMPLE POPULATION

The fourth concern of this investigation was to determine the status of the health knowledge of senior students majoring in health education at four selected universities in North Carolina offering degrees in health education. This entailed three steps as stated below:

1. the collection of demographic data of the health education respondents in the four selected universities in North Carolina,
2. the obtaining of scores from the health education respondents through the use of the testing instrument,
3. the determination of differences between the mean and standard deviations of the health education respondents in the four selected universities in North Carolina, within each health topic area.

Collection of Demographic Data

Data collection for the health knowledge of senior students majoring in health education at selected universities in North Carolina was completed March 20, 1977. A total of 70 student scores was obtained from the four universities in North Carolina. The total number of participants included 12 males and 58 females. The ages ranged from 20 to 52, with the 20 to 27 year old age range accounting for 62 of the respondents, 29 to 35 for four respondents, and 36 to 52 for the remaining four. The mean

age range was 24.4, with a median age of 22.

Data concerning program emphasis in health education were also collected and recorded. The total number of health education majors with an emphasis in school health education was 32. The remaining 38 health education majors had an emphasis in community health education.

Table IV presents a summary of the demographic data collected for question number four.

It should be noted that additional demographic data was collected by the investigator. This included overall grade point average, grade point average of major, and the number of courses completed in seven subject areas. These areas were: Biology, Physiology, Chemistry, Physics, Psychology, Sociology, and Health Education (including First Aid courses) (see Appendix C). This demographic material was non-representative of subjects because repondents were not always aware of the above-mentioned data. A random sample of student records indicated it was not a reliable source of information.

TEST SCORE RESULTS

Appendix D shows the test scores achieved by the health education respondents on the testing instrument, the Phillips Health Knowledge Test (Phillips, 1974). The range of scores of all four universities was from 34 to 74. The mean for all four universities was 55.46, with a median score of 57. Appendix D presents the scores of each individual health topic

TABLE IV

SUMMARY OF DEMOGRAPHIC DATA FOR
INSTITUTIONS IN NORTH CAROLINA OFFERING DEGREES
IN HEALTH EDUCATION

		SEX		AGE			PROGRAM EMPHASIS	
Institution		Male	Female	Range	Mean	Median	School Health	Comm. Health
A		1	27	21-44	23.5	22	10	18
B		4	14	21-27	22.4	22	7	11
C		4	6	20-52	29.5	23.5	10	10
D		3	11	21-36	25.5	23	5	9
A,B,C,D	TOTAL	12	58	20-52			32	38
A,B,C,D	MEANS				24.4	22	8	9.5

area obtained from the respondents. The four universities obtained score ranges of: (A) 46-74; (B) 34-60; (C) 50-67; (D) 34-62.

Differences in the Testing Results Among the Four Universities

In comparison to the norms obtained in the Phillips Health Knowledge Study (appendix C), the respondents in the universities in North Carolina scored higher. University A, with a mean score of 59.61, ranked in the 85th percentile. University B, with a mean score of 51.06, ranked in the 55th percentile. With a mean score of 59.10, University C ranked in the 85th percentile. University D, with a mean score of 50.21, ranked in the 50th percentile.

It is significant to note that the respondents in the Phillips Health Knowledge Study were college freshmen and the sample population tested in this study was senior health education majors.

Table V shows the difference between the mean, median, and mode scores of the four selected universities in North Carolina (labeled A, B, C, and D), ranked in order.

Topic Area Difficulty

An analysis of the correct and incorrect responses for the individual health topic areas between the universities and within each university was computed. A four-way analysis of variance was computed to obtain information for question number four. The scores obtained for the universities

TABLE V

THE ANALYSIS OF VARIANCE PERFORMED BETWEEN THE MEAN SCORES OBTAINED BY HEALTH EDUCATION SENIORS IN UNIVERSITIES IN NORTH CAROLINA OFFERING DEGREES IN HEALTH EDUCATION

Institution	Respondents	Mean	Median	Mode	S. D.	Range
A	28	59.61	58.5	57	6.45	46-74
B	18	51.06	54.5	59	8.73	34-60
C	10	59.10	59.5	50,67	7.16	50-67
D	14	50.21	47.5	45,46 47,60	7.75	34-62
A,B,C,D TOTAL	70	55.46	57	56, 57 59,60,67	7.40	34-74

ANOVA of Total Scores

Variable	DF	Sum of Squares	Mean Square	F Value	PR>F*
Between Universities	3	348.49	449.50	8.10	0.0001
Within Universities	66	3660.88	55.47		

*Probability values greater than .05 percent.

indicated a significant difference at the .05 level with the following topic areas: Environmental Health, Diseases, Physical Fitness, Family Life Education, Consumer Health, Drugs, and Safety Education. The scores obtained in the areas of Community Health, Nutrition, and Mental Health did not reach a significant difference at the .05 level.

The following tables (Tables VI through XV) present the mean correct responses for the students at all four universities, with statistical analysis of each individual health topic area.

SUMMARY

Chapter IV has presented the data collected in the study. The chapter contains the presentation and discussion of: (1) the completed questionnaire received from the selected universities in the United States offering degrees in health education, (2) the demographic data collected pertaining to the sample employed in the study, (3) the results of scores obtained by the health education respondents, and (4) the differences in mean and standard deviation scores obtained by the health education respondents in the four universities, within each health topic area.

Chapter V will present a summary of the data collected in Chapter IV, including conclusions and recommendations for further research.

TABLE VI

ANALYSIS OF VARIANCE PERFORMED BETWEEN THE MEAN SCORES OBTAINED ON ENVIRONMENTAL HEALTH QUESTIONS

Institution	N	Mean	S. D.	Range
A	28	4.46	1.40	1-7
B	18	3.83	1.29	1-6
C	10	4.80	1.03	3-6
D	14	2.86	1.70	0-6

ANOVA of Environmental Health

Variable	DF	Sum of Squares	Mean Square	F Value	PR>F
Between Universities	3	31.16	10.39	5.32	0.0025*
Within Universities	66	128.78	1.95		

*Probability values greater than .05 percent.

TABLE VII

ANALYSIS OF VARIANCE PERFORMED BETWEEN THE MEAN SCORES OBTAINED ON COMMUNITY HEALTH QUESTIONS

Institution	N	Mean	S. D.	Range
A	28	5.64	1.06	3-8
B	18	5.61	0.98	4-7
C	10	5.00	1.25	3-7
D	14	6.14	1.23	4-8

ANOVA of Community Health

Variable	DF	Sum of Squares	Mean Square	F Value	PR> F
Between Universities	3	7.65	2.55	2.09	0.1081
Within Universities	66	80.42	1.21		

TABLE VIII

ANALYSIS OF VARIANCE PERFORMED BETWEEN THE MEAN SCORES OBTAINED ON DISEASE QUESTIONS

Institution	N	Mean	S. D.	Range
A	28	5.86	1.43	2-8
B	18	5.00	1.28	2-6
C	10	6.60	1.07	5-8
D	14	5.21	1.31	2-7

ANOVA of Diseases

Variable	DF	Sum of Squares	Mean Square	F Value	PR> F
Between Universities	3	20.40	6.80	3.86	0.0131*
Within Universities	66	116.19	1.76		

*Probability values greater than .05 percent.

TABLE IX

ANALYSIS OF VARIANCE PERFORMED BETWEEN THE MEAN SCORES OBTAINED ON NUTRITION QUESTIONS

Institution	N	Mean	S. D.	Range
A	28	6.04	1.29	3-8
B	18	5.39	1.20	3-7
C	10	6.20	2.10	3-8
D	14	5.00	1.71	2-8

ANOVA of Nutrition

Variable	DF	Sum of Squares	Mean Square	F Value	PR > F
Between Universities	3	14.24	4.75	2.13	0.1028
Within Universities	66	146.84	2.22		

TABLE X

ANALYSIS OF VARIANCE PERFORMED BETWEEN THE MEAN SCORES OBTAINED ON PHYSICAL FITNESS QUESTIONS

Institution	N	Mean	S. D.	Range
A	28	5.46	1.48	2-8
B	18	4.78	1.59	2-7
C	10	6.10	1.60	4-8
D	14	4.50	1.51	2-7

ANOVA of Physical Fitness

Variable	DF	Sum of Squares	Mean Square	F Value	PR > F
Between Universities	3	20.11	6.70	2.86	0.0426*
Within Universities	66	154.48	2.34		

*Probability values greater than .05 percent.

TABLE XI

ANALYSIS OF VARIANCE PERFORMED BETWEEN THE MEAN SCORES OBTAINED ON FAMILY LIFE QUESTIONS

Institution	N	Mean	S. D.	Range
A	28	6.64	1.19	4-8
B	18	5.50	1.34	3-7
C	10	5.90	1.29	4-8
D	14	4.79	1.05	3-7

ANOVA of Family Life

Variable	DF	Sum of Squares	Mean Square	F Value	PR > F
Between Universities	3	35.66	11.89	7.99	0.0002*
Within Universities	66	98.19	1.49		

*Probability values greater than .05 percent.

TABLE XII

ANALYSIS OF VARIANCE PERFORMED BETWEEN THE MEAN SCORES OBTAINED ON CONSUMER HEALTH QUESTIONS

Institution	N	Mean	S. D.	Range
A	28	7.04	1.26	3-8
B	18	4.78	1.67	2-7
C	10	6.20	1.62	3-8
D	14	5.36	1.34	3-7

ANOVA of Consumer Health

Variable	DF	Sum of Squares	Mean Square	F Value	PR> F
Between Universities	3	63.11	21.04	10.14	0.0001*
Within Universities	66	136.89	2.07		

*Probability values greater than .05 percent.

TABLE XIII

ANALYSIS OF VARIANCE PERFORMED BETWEEN THE MEAN SCORES OBTAINED ON DRUG EDUCATION QUESTIONS

Institution	N	Mean	S. D.	Range
A	28	5.79	1.40	3-8
B	18	5.17	1.34	3-8
C	10	5.60	1.35	4-8
D	14	4.57	1.22	2-6

ANOVA of Drug Education

Variable	DF	Sum of Squares	Mean Square	F Value	PR>F
Between Universities	3	15.03	5.01	2.78	0.0473*
Within Universities	66	119.04	1.80		

*Probability values greater than .05 percent.

TABLE XIV

ANALYSIS OF VARIANCE PERFORMED BETWEEN THE MEAN SCORES OBTAINED ON MENTAL HEALTH QUESTIONS

Institution	N	Mean	S. D.	Range
A	28	6.29	1.21	3-8
B	18	5.56	1.46	3-8
C	10	6.20	0.63	5-7
D	14	6.00	1.24	4-8

ANOVA of Mental Health

Variable	DF	Sum of Squares	Mean Square	F Value	PR>F
Between Universities	3	6.18	2.06	1.36	0.2607
Within Universities	66	99.76	1.51		

TABLE XV

ANALYSIS OF VARIANCE PERFORMED BETWEEN THE MEAN SCORES OBTAINED ON SAFETY EDUCATION QUESTIONS

Institution	N	Mean	S. D.	Range
A	28	6.39	0.83	5-8
B	18	5.44	1.50	1-7
C	10	6.50	0.85	5-8
D	14	5.79	1.53	3-8

ANOVA of Safety Education

Variable	DF	Sum of Squares	Mean Square	F Value	PR> F
Between Universities	3	12.89	4.30	3.02	0.0355*
Within Universities	66	93.98	1.42		

*Probability values greater than .05 percent.

CHAPTER V

SUMMARY AND CONCLUSIONS

The main purposes of this study were: (1) to determine the number of colleges and universities in the United States offering degrees in health education that utilize a standardized health knowledge test for their health education majors' health knowledge assessment; (2) to determine the number of colleges and universities in the United States offering degrees in health education that utilize an instrument that might be employed as an assessment of their health education majors; (3) to determine the health knowledge tests that are currently being employed by colleges and universities in the United States offering degrees in health education; and (4) to determine the status of the health knowledge of senior students in North Carolina in the field of health education as determined by the Phillips Health Knowledge Test (Phillips, 1975).

In order to accomplish the first three purposes of the study, a questionnaire was sent to the director or chairperson of the department in 98 colleges and universities in the United States offering degrees in health education. The directors received a letter of introduction, an explanation regarding the purposes of the questionnaire, and a post card containing the questions for the study.

The information being sought in the questionnaire was as follows:

1. Do you currently utilize a standardized health knowledge test for assessment of your health education majors?

2. Do you have any available tests which might be employed as an assessment of your health education majors? If so, what is the title and would you be willing to share it with me?

Eighty-eight institutions responded to the questionnaire. The responses for each question were totaled. The names of the standardized health knowledge tests and non-standardized tests were collected and recorded.

The fourth purpose of the study was to measure the health knowledge of senior health education majors at selected universities in North Carolina, as determined by a valid and reliable health knowledge instrument. The questionnaire and review of literature that was conducted identified health knowledge instruments, of which nine of the most recent tests, developed since 1964, were examined for possible use in the study. After letters were written to each of the nine authors requesting a copy of his or her test, four were reviewed for possible use in the study. The tests were then reviewed by seven of the best available experts from the fields of physical and health education. The results indicated the Phillips Health Knowledge Test to be the most appropriate health knowledge instrument.

The sample population was senior health education majors from selected universities in North Carolina that offer undergraduate degrees in health education. Five institutions were identified: Appalachian State University, East Carolina University, North Carolina Central University, University of

North Carolina at Greensboro, and Western Carolina University.

Western Carolina University was omitted from the study due to having only one senior health education major at the time of the study. The remaining four universities each received a letter of explanation about the study and a request for cooperation. With each health education department's permission, the Phillips Health Knowledge Test was administered. There was a total of 70 senior health education majors participating in the study. The percentage of correct responses was computed for the total number of items, for each of the ten health topic areas, and for each individual item. The mean and standard deviation was computed for each university. Comparison of the dependent variables was made by utilizing a four-way analysis of variance (ANOVA) to determine significant differences among the universities.

CONCLUSIONS

The data collected in the study support the following conclusions:

1. Few universities in the United States offering degrees in health education utilize standardized health knowledge tests for their health education majors' health knowledge assessment. From the questionnaires given to the universities in the United States offering degrees in health education, only 6.8 percent of the institutions utilize a standardized health knowledge test for their health education majors.

2. The universities in the United States offering degrees in health education identified few health knowledge instruments currently being employed. From the questionnaires returned, three standardized health knowledge tests were acknowledged: The Kilander-Leach Health Knowledge Test (1972), the Dearborn College Health Knowledge Test (1959), and the Health Science Content Competency Exam.

3. A significant difference in health knowledge existed between the senior students in the four universities in North Carolina offering degrees in health education.

4. A significant difference in health knowledge existed among the respondents in the four North Carolina universities in the following health topic areas: Environmental Health, Diseases, Physical Fitness, Family Life Education, Consumer Health, Drug Education, and Safety Education.

5. No significant difference in health knowledge existed between the respondents in the four universities in North Carolina in the following health topic areas: Nutrition, Community Health, and Mental Health.

DISCUSSION

The following interpretation and discussion of the conclusions are offered:

The data collected from the questionnaire given to universities in the

United States that offer degrees in health education provide indication that few institutions utilize standardized health knowledge tests.

An examination of the data collected from the four selected North Carolina universities indicated that significant differences exist among the students' health knowledge in the four universities. The fact that one university ranked higher overall in health knowledge as compared to another may indicate that health knowledge concepts are stressed more in the health education program at that particular university.

Another reason for the differences in results may be attributed to the type of student who goes to one university as opposed to another. The importance stressed in performance on the health knowledge test by the professors at each university during administration of the instrument differed a great deal. This may have been an influence on the differences in results of the test scores.

When examining the data, a definitive statement cannot be made stating that one university is superior; however, it was clearly seen that significant differences did appear between universities in seven of the ten health topic areas of the test.

RECOMMENDATIONS

As a result of this study, the following recommendations are made:

1. Students in the field of health education should be tested for their health knowledge through the use of a valid and reliable standardized

health knowledge instrument. By assessment, improvement of the health education curriculum might be made. Assessment of health knowledge may detect strengths and weaknesses in the teaching procedures and/or areas needing emphasis in the health education curriculum.

2. Students in the field of health education should be tested for other competencies (i.e., teaching skills, etc.) in health education, in addition to health knowledge.

3. Health knowledge tests should be collected and listed in a bibliographical form. This list should be kept up to date; further, it should be made available for universities and colleges which wish to utilize a health knowledge instrument for academic, curriculum, or research purposes.

4. Standardized health knowledge tests should be devised specifically for assessment of health education majors' health knowledge.

BIBLIOGRAPHY

BIBLIOGRAPHY

Barrett, Morris. Health education (2nd ed.). Philadelphia: Lea & Febiger, 1974.

Beyrer, Mary K. Health Education Completed Research. AAHPER Publications, 1974.

Bjerke, Richard A. Relationships between self-appraised health knowledge and tested health knowledge in selected eleventh grade students. Unpublished masters thesis, University of Washington, 1966.

Bridges, A. Frank. A valid health knowledge test for college freshmen. Unpublished doctoral dissertation, Indiana University, 1952.

Bush, Herman Spencer. A health analogies pretest for a basic college health course. Unpublished doctoral dissertation, Indiana University, 1969.

Crawford, Marilyn (Author). Madison Health Knowledge Test. Harrisonburg, Va.: Madison College, 1964.

Davis, Frederich B., Chairperson. Standards for Educational and Psychological Tests. Washington, D. C.: American Psychological Association, 1974.

Dearborn, Terry H. (Author). College Health Knowledge Test (Rev. ed.). Stanford, Cal.: Stanford University Press, 1959.

Eisner, Victor and Callan, Laurence B. Dimensions of school health. Springfield, Ill.: Thomas, 1974.

Fast, Charles G. (Ed.) and Tyson, Harry L., Jr. Fast-Tyson Health Knowledge Test. Kirksville, Missouri, 1975.

Fodor, John T. and Dalis, Gus. Health instruction: Theory and application. Philadelphia: Lea & Febiger, 1974.

Helmstadter, G. C. Research concepts in human behavior education, psychology, sociology. New Jersey: Prentice-Hall, 1970.

Johns, Edward B. Effective health teaching journal articles. Journal of School Health, March 1964, 34(3).

Kilander, H. Frederick and Leach, Glen C. Kilander-Leach Health Knowledge Test (Rev. ed.). Ridgewood, N. J.: The Rocco Press, 1972.

Krueger, Esther S. A study of the health knowledge of graduating elementary teachers at Newark State College. Unpublished doctoral dissertation, Columbia University, 1970.

Lussier, Richard Roy. A multidimensional instrument to identify health education needs for college students. Unpublished doctoral dissertation, University of California, 1970.

Maughan, Richard L. A comparative survey of health knowledge between sophomores at Utah State University and the University of Utah. Unpublished masters thesis, Utah State University, 1970.

Oberteuffer, Delbert. Health and education--An appraisal II journal articles. Journal of School Health, Feb. 1968, 38(2).

Phillips, Donavan J. The development and standardization of a personal health knowledge test for college students. Unpublished doctoral dissertation, University of Oregon, 1975.

Pigg, R. Morgan, Jr. A national study of competency-based health education programs. Health Education, July/Aug. 1975, 7(4).

Pigg, R. Morgan, Jr. The Georgia Health Education Study. Athens, Ga.: University of Georgia, Sept. 1976. (Summary)

President's Commission on Higher Education. Higher Education for American Democracy. Washington, D. C.: U. S. Government Printing Office, 1974.

Rash, Jesse Keogh. The Health Education Curriculum. Bloomington, Indiana: Indiana University, 1955.

Schneider, Robert E. Methods and materials of health education (2nd ed.). Philadelphia: Saunders, 1964.

Solleder, Marian K. A bibliography of tests of knowledge, attitude, and behavior, for elementary, secondary, and college levels. The Ohio State University, AAHPER, 1965.

Walch, John Weston. Successful devices in health education. Portland, Me.: J. Weston Walch, 1962.

Wallen, Norman E. Educational research, a guide to the process. Belmont, Cal.: Wadsworth Publishing Co., 1974.

Wrestler, Frank A. (Ed.). A national directory of college and university school and public health educators (3rd ed.). Muncie, Ind.: Eta Sigma Gamma, 1975.

REFERENCES

REFERENCES

Beyrer, M. K. Health Education Completed Research. AAHPER Publications, 1974.

Bjerke, R. A. Relationships between self-appraised health knowledge and tested health knowledge in selected eleventh grade students. Unpublished masters thesis, University of Washington, 1966.

Bridges, A. F. A valid health knowledge test for college freshmen. Unpublished doctoral dissertation, Indiana University, 1952.

Bush, H. S. A health analogies pretest for a basic college health course. Unpublished doctoral dissertation, Indiana University, 1969.

Crawford, M. (Author). Madison Health Knowledge Test. Harrisonburg, Va.: Madison College, 1964.

Dearborn, T. H. (Author). College Health Knowledge Test (Rev. ed.). Stanford, Calif.: Stanford University Press, 1959.

Fast, C. G. (Ed.), & Tyson, H. L., Jr. Fast-Tyson Health Knowledge Test. Kirksville, Missouri, 1975.

Helmstadter, G. C. Research concepts in human behavior education, psychology, sociology. New Jersey: Prentice-Hall, 1970.

Johns, E. B. Effective health teaching journal articles. Journal of School Health, March 1964, 34(3), 123-131.

Kilander, H. F., & Leach, G. C. Kilander-Leach Health Knowledge Test (Rev. ed.). Ridgewood, N. J.: The Rocco Press, 1972.

Lussier, R. R. A multidimensional instrument to identify health education needs for college students. Unpublished doctoral dissertation, University of California, 1970.

Maughan, R. L. A comparative survey of health knowledge between sophomores at Utah State University and the University of Utah. Unpublished masters thesis, Utah State University, 1970.

Oberteuffer, D. Health and education--An appraisal II journal articles. Journal of School Health, Feb. 1968, 38(2), 72-84.

Phillips, D. J. The development and standardization of a personal health knowledge test for college students. Unpublished doctoral dissertation, University of Oregon, 1975.

Pigg, R.M., Jr. A national study of competency-based health education programs. Health Education, July/Aug. 1975, 7(4).

President's Commission on Higher Education. Higher Education for American Democracy. Washington, D. C.: U. S. Government Printing Office, 1947, 101.

Rash, J. K. The Health Education Curriculum. Bloomington, Indiana: Indiana University, 1955, 135.

Solleder, M. K. A bibliography of tests of knowledge, attitude, and behavior, for elementary, secondary, and college levels. The Ohio State University, AAHPER, 1965.

Wrestler, F. A. (Ed.). A national directory of college and university school and public health educators (3rd ed.). Muncie, Ind.: Eta Sigma Gamma, 1975.

APPENDICES

APPENDIX A

South Spencer, Box 172
University of North Carolina
Greensboro, North Carolina 27412
September 7, 1976

Universities in the United States
offering degrees in Health Education

Dear

As a graduate student in Health Education at the University of North Carolina at Greensboro, I am currently working on my master's thesis. The project entails health knowledge measurement of the health education majors in our department. In order to obtain the necessary information an instrument in the area of health education knowledge is needed, which is reliable and valid.

I am enclosing a very brief questionnaire which would be most helpful to me in this endeavor. If you would take a moment to fill it out, I would greatly appreciate it. Thank you for your time and effort.

Sincerely yours

Susan Tuthill
Graduate Assistant

NOTE: If you are currently using a self-constructed form of assessment and would be willing to share it, please send me a copy. I will, of course, give full credit to the authors in any reference I make to it.

QUESTIONNAIRE GIVEN TO UNIVERSITIES IN THE UNITED STATES OFFERING DEGREES IN HEALTH EDUCATION

YES or *NO* *Do you currently utilize a standardized health knowledge test for assessment of your Health Education majors? If so, what is the title and where can it be obtained?*

_____

_____

_____

YES or *NO* *Do you have any available tests which might be employed as an assessment of Health Education majors? If so, what is the title and would you be willing to share it with me?*

_____

_____

_____

South Spencer, Box 172
University of North Carolina
Greensboro, North Carolina 27412
March 10, 1976

Dr. Andrew J. J. Brennan - Hunter College
Dr. Linda Burchans - University of California
Ms. Marilyn Crawford - Madison College
Dr. Terry H. Dearborn - Stanford University
Dr. John Horwitz - University of California
Dr. Glen Leach - Wagner College
Dr. Richard Roy Lussier - University of California
Dr. Donavan J. Phillips - University of Oregon
Mr. Reza Shahrokh - University of Southern Illinois

Dear

As a graduate student in Health Education at the University of North Carolina at Greensboro, I am currently working on my thesis. The project entails knowledge measurement of the health majors in our department. In order to obtain this survey I need a test instrument, which hopefully you will be able to supply. The test I am referring to is the _____.

According to my information the most recent form of this test was published in _____. Of course, I would need an updated version of this test.

It would be very helpful to the department and to myself if you could send me the most recent form of this test, or let me know if it has not been updated. A prompt reply would be of great assistance.

Thank you for your time and effort.

Sincerely yours,

Susan Tuthill
Teaching Assistant

November 30, 1976

Dr. Pearl Berlin
Dr. Rosemary McGee
Ms. Karen King
Dr. Todd Mommsen
Dr. Marian Solleder
Dr. Raymond Vincent
Dr. Glen Gilbert

Dear Faculty Members:

As a graduate student in Health Education, I am currently engaged in preparing my research project. The purpose of my study is to measure the health knowledge of the seniors in our department. In order to obtain this measurement, a reliable test instrument is needed. I would like to request your assistance in selecting the proper instrument.

Enclosed you will find four health knowledge tests and information concerning their reliability. Please review each instrument and inform me of your choice as soon as possible by filling out the envelope provided for you. After your selection is made, it would be greatly appreciated if you would pass this material to the next faculty member listed.

Your promptness is necessary as the tentative testing date has been set for December 7th.

Thank you very much for your cooperation.

Sincerely yours,

Susan Tuthill
Teaching Assistant
Department of Health Education

I. *Please rate each test, 1-4*
(one being the highest rating)

Kilander Health Knowledge Test ____

Madison Health Knowledge Test ____

Phillips Health Knowledge Test ____

Health Knowledge Test by
Richard L. Maughan ____

II. *Briefly list the criteria you used to rate each test.*

III. *Briefly explain the reason why you chose the test as your first choice.*

Ronald Somers, President

Blue Mountain Community College

24 N.W. Carden P.O. Box 100 Pendleton, Oregon 97801 Area 503 276-1260

April 20, 1976

Susan Tuthill
Teaching Assistant
S. Spencer, Box 172
University of North Carolina
Greensboro, North Carolina 27412

Dear Ms. Tuthill:

Enclosed is a health knowledge test which you requested. I have also included test information and a copy of my dissertation abstract for additional test details. I hope to develop a test information manual and market the test later this year.

If you wish to use this test within your thesis for testing health majors, you have my permission to do so. You may wish to retype the test at your university, or I will supply you with additional tests @ 25¢ a copy.

Please let me know if I can be of further assistance.

Sincerely yours,

Dr. Don Phillips
Health and Physical Education Instructor
Blue Mountain Community College

DP/jg

South Spencer, Box 172
University of North Carolina
Greensboro, North Carolina 27412
February 3, 1977

Ms. Sandra Cross - Appalachian State University
Mr. Rick Barnes - East Carolina University
Dr. Howard Fitts - North Carolina Central University

Dear Health Educator:

As a graduate student in Health Education at the University of North Carolina at Greensboro, I am currently engaged in my master's thesis. One of the dimensions of the study is to measure the health knowledge of seniors majoring in Health Education at selected universities in North Carolina. As one of the universities offering a major program in health education, I am soliciting your cooperation for the study.

If you are willing to cooperate, I would like to schedule a time to administer a knowledge achievement test to your senior majors. The test procedures will require an hour and a half. The results will be available to you if desired, and the universities involved will not be identified by name, nor will the individual participants.

With your cooperation, please return the enclosed form and I will get in touch with you. If you have any further questions, please contact me or my thesis adviser, Dr. Glen Gilbert, at 919/379-5708.

Thank you for your time.

Sincerely yours,

Susan Tuthill

_____

NAME

_____

INSTITUTION

_____ *We do not wish to cooperate in the study.*

_____ *Yes, we are willing to cooperate in the study.*

_____ *The following are dates and times where it would be possible to administer the achievement test to our seniors:*

DATES	*TIME and LOCATION*

APPENDIX B

Test results of the Phillips Health Knowledge Test, given to a total of nineteen participating universities, colleges, or community colleges in the State of Oregon during the last two weeks of Spring term, 1974. The participating college students were enrolled in the Personal Health course (HE 250) or its equivalent.

Number of Students	*1281*
Number of Questions	*80*
Mean	*49.049*
Median	*49*
Mode	*51*
Range	*61 13 to 74*
Standard Deviation	*10.33*
Reliability of Test (Kuder-Richardson formula 20)	*.852*
Standard Error of Measurement	*3.971*

APPENDIX I

NORMS FOR THE PHILLIPS HEALTH KNOWLEDGE TEST

Raw Score	Percentile	T-Score	Z-Score
80		80.00	3.00
79		79.01	2.90
78		78.04	2.80
77		77.07	2.71
76		76.10	2.61
75		75.13	2.51
74		74.16	2.42
73		73.19	2.32
72		72.22	2.22
71		71.25	2.13
70	99th	70.28	2.03
69		69.32	1.93
68		68.35	1.84
67		67.38	1.74
66		66.41	1.64
65	95th	65.44	1.54
64		64.47	1.45
63		63.51	1.35
62	90th	62.54	1.25
61		61.57	1.16
60	85th	60.60	1.06
59		59.63	.96
58	80th	58.67	.87
57	75th	57.70	.77
56		56.73	.67
55	70th	55.76	.58
54	65th	54.79	.48
53	60th	53.83	.38
52		52.86	.29
51	55th	51.89	.19
50	50th	50.92	.09
49	45th	49.96	-.01
48		48.98	-.10
47	40th	48.02	-.20
46	35th	47.05	-.30
45		46.08	-.39
44	30th	45.11	-.49
43		44.14	-.59

APPENDIX I - continued

Raw Score	Percentile	T-Score	Z-Score
42	25th	43.18	- .68
41		42.21	- .78
40	20th	41.24	- .88
39		40.27	- .97
38	15th	39.30	-1.07
37		38.34	-1.17
36		37.37	-1.26
35	10th	36.40	-1.36
34		35.43	-1.46
33		34.46	-1.55
32		33.50	-1.65
31	5th	32.53	-1.75
30		31.56	-1.84
29		30.59	-1.94
28		29.62	-2.04
27		28.65	-2.14
26		27.69	-2.23
25		26.72	-2.33
24		25.75	-2.43
23	1st	24.78	-2.52
22		23.81	-2.62
21		22.85	-2.72
20		21.88	-2.81
19		20.91	-2.91
18		19.94	-3.01
17		18.97	-3.10
16		18.01	-3.20
15		17.04	-3.30
14		16.07	-3.39
13		15.10	-3.49
12		14.13	-3.59
11		13.17	-3.68
10		12.20	-3.78
9		11.23	-3.88
8		10.26	-3.97
7		9.29	-4.07
6		8.33	-4.17
5		7.36	-4.26
4		6.39	-4.36
3		5.42	-4.46
2		4.45	-4.55
1		3.49	-4.65
0		2.52	-4.75

TABLE 10

TOPIC AREA DIFFICULTY AND POSITION OF ITEMS IN THE FINAL TEST FORM

Topic Area	Item Number	Mean Diff. of Topic Area
Environmental Health Hazards	10, 13, 25, 26, 27, 28, 41, 67	.518
Community Health	11, 19, 20, 31, 45, 47, 59, 80	.584
Diseases	2, 3, 16, 22, 35, 36, 48, 75	.596
Nutrition	32, 34, 39, 42, 54, 57, 68, 76	.601
Physical Health, Wholesome Activity and Rest	5, 14, 33, 50, 52, 65, 70, 77	.602
Family Life Education	1, 8, 23, 24, 55, 58, 60, 74	.638
Consumer Health	15, 38, 56, 63, 64, 71, 72, 73	.641
Mental Health	6, 9, 12, 18, 37, 40, 51, 61	.653
Drug Use and Misuse	17, 29, 30, 43, 44, 46, 49, 69	.655
Safety Education	4, 7, 21, 53, 62, 66, 78, 79	.672

APPENDIX C

INSTRUCTIONS FOR ADMINISTERING HEALTH KNOWLEDGE TEST

Before reading directions of the test to the class, inform the students the importance of accuracy in answering the test questions.

Information to be obtained:

A. To measure the health knowledge of senior students in the field of health education from universities in North Carolina, offering degrees in health education.

B. To determine the present knowledge strengths and/or weaknesses of the senior majors in health education at selected universities in North Carolina offering degrees in health education.

The results will be available to the person taking the test through the instructors of the department. The results will be anonymous to anyone else.

Place demographic information, other than name, on back side of your answer sheet. Name should be on front side.

1. *Name of university attending*
2. *Age*
3. *Sex*
4. *Overall grade point average*
5. *Grade point average of major*

6. List the number of college courses you have completed in each of these subject areas:

A. Biology
B. Physiology
C. Chemistry
D. Physics
E. Psychology
F. Sociology
G. Health Courses (including First Aid)

On the answer sheet in the lower right hand corner, the numbers 1, 2, 3, and 4 are listed. Place a "0" in each blank. Blacken the corresponding number in each grid.

Fill in (in the space provided on answer sheet) the appropriate date. Blacken the corresponding number in each grid.

Write the number of your test at the upper right hand corner of the answer sheet.

Allow 60 minutes for completion of the test.

APPENDIX D

APPENDIX D

RAW SCORES OBTAINED FROM HEALTH EDUCATION MAJORS IN NORTH CAROLINA

Institution A.		Raw Scores - Subject Areas*									
ID No.	Raw Score	ENVI	COM HEA	DIS	NUT	PHY FT	FAM LIFE	CONS HEA	MEN	DRUG	SAFE
01	59	4	6	6	5	7	7	7	6	5	6
02	59	4	5	7	7	2	8	7	6	7	6
03	60	3	4	6	5	7	4	8	7	8	8
04	63	5	6	7	6	6	7	8	7	5	6
05	61	5	7	5	6	5	8	6	6	7	6
06	64	7	6	7	6	4	7	8	8	5	6

*The ten health topic areas are abbreviated as stated below:

ENVI - Environmental Health Hazards
COM HEA - Community Health
DIS - Diseases
NUT - Nutrition
PHY FT - Physical Fitness
FAM LIFE - Family Life
CONS HEA - Consumer Health
MEN - Mental Health
DRUGS - Drug Use and Misuses
SAFE - Safety Education

APPENDIX D - continued

RAW SCORES OBTAINED

Institution A.

Raw Scores - Subject Areas*

ID No.	Raw Score	ENVI	COM HEA	DIS	NUT	PHY FT	FAM LIFE	CONS HEA	MEN	DRUG	SAFE
07	64	5	5	7	6	6	8	8	8	5	6
08	64	4	6	6	8	6	6	8	6	7	7
09	66	6	5	7	8	5	6	8	7	8	6
10	67	6	6	7	7	6	5	8	7	8	7
11	67	6	6	6	7	6	8	7	8	6	7
12	67	6	7	6	8	7	7	6	7	7	6
13	70	6	6	8	7	8	6	8	6	7	8
14	74	7	8	8	8	7	8	8	7	7	6
15	49	4	7	4	3	7	6	5	4	4	5
16	51	3	4	4	6	5	5	8	6	4	6
17	52	6	3	6	5	6	5	3	6	5	7
18	55	3	6	6	6	3	8	7	5	6	5
19	55	4	7	3	5	7	6	7	6	4	6

APPENDIX D - continued

RAW SCORES OBTAINED

Institution A.

		Raw Scores - Subject Areas*									
ID No.	Raw Score	ENVI	COM HEA	DIS	NUT	PHY FT	FAM LIFE	CONS HEA	MEN	DRUGS	SAFE
20	56	4	5	5	4	5	8	7	8	4	6
21	56	4	5	4	6	4	7	8	5	6	7
22	57	4	5	6	5	5	6	8	5	6	7
23	57	4	6	5	6	5	8	7	5	6	5
24	57	3	5	7	4	5	6	7	7	5	8
25	57	1	6	6	7	6	6	8	7	4	6
26	58	4	5	6	5	5	8	5	7	6	7
27	58	4	5	7	6	2	7	7	6	7	7
28	46	3	6	2	7	6	5	5	3	3	6

Institution B.

		Raw Scores - Subject Areas*									
ID No.	Raw Score	ENVI	COM HEA	DIS	NUT	PHY FT	FAM LIFE	CONS HEA	MEN	DRUGS	SAFE
01	54	4	7	6	6	4	6	5	6	3	7
02	55	4	7	6	5	5	5	6	6	5	6

APPENDIX D - continued

RAW SCORES OBTAINED

Institution B.

Raw Scores - Subject Areas*

ID No.	Raw Score	ENVI	COM HEA	DIS	NUT	PHY FT	FAM LIFE	CONS HEA	MEN	DRUGS	SAFE
03	55	3	5	5	7	5	5	6	6	6	7
04	56	4	6	6	5	7	7	5	6	6	4
05	56	5	6	5	7	5	6	4	8	5	5
06	59	5	7	6	5	5	6	7	8	6	4
07	59	6	5	6	5	6	6	6	7	5	7
08	60	6	5	6	7	6	7	5	7	5	6
09	60	4	7	6	6	6	6	7	6	6	6
10	59	4	6	6	5	7	6	7	6	6	6
11	34	2	4	4	4	2	3	3	4	4	4
12	35	1	5	6	5	3	5	2	3	4	1
13	38	3	5	2	4	3	6	3	3	4	5
14	41	3	5	5	3	2	7	2	5	3	6
15	45	5	6	4	4	5	3	4	5	4	5

APPENDIX D - continued

RAW SCORES OBTAINED

Institution B.

Raw Scores - Subject Areas*

ID No.	Raw Score	ENVI	COM HEA	DIS	NUT	PHY FT	FAM LIFE	CONS HEA	MEN	DRUGS	SAFE
16	50	4	6	3	7	4	3	5	5	7	6
17	51	3	5	3	6	4	7	6	5	6	6
18	52	3	4	5	6	7	5	3	4	8	7

Institution C.

Raw Scores - Subject Areas*

ID No.	Raw Score	ENVI	COM HEA	DIS	NUT	PHY FT	FAM LIFE	CONS HEA	MEN	DRUGS	SAFE
01	62	4	5	8	8	8	4	6	6	7	6
02	65	6	6	5	8	7	7	7	6	6	7
03	66	4	6	7	7	6	6	8	7	8	7
04	67	6	6	7	8	8	7	8	6	5	6
05	67	5	7	8	8	5	8	8	7	5	6
06	50	3	4	7	3	5	5	6	6	5	6
07	50	4	5	6	3	4	6	6	5	4	7
08	51	6	3	5	4	4	6	3	6	7	7

APPENDIX D - continued

RAW SCORES OBTAINED

Institution C.

		Raw Scores - Subject Areas*									
ID No.	Raw Score	ENVI	COM HEA	DIS	NUT	PHY FT	FAM LIFE	CONS HEA	MEN	DRUGS	SAFE
09	56	5	4	7	6	6	4	5	6	5	8
10	57	5	4	6	7	8	6	5	7	4	5

Institution D.

		Raw Scores - Subject Areas*									
ID No.	Raw Score	ENVI	COM HEA	DIS	NUT	PHY FT	FAM LIFE	CONS HEA	MEN	DRUGS	SAFE
01	52	4	7	6	6	3	4	6	4	5	7
02	48	4	6	6	2	6	5	5	6	4	4
03	53	2	7	5	4	7	4	7	7	4	6
04	58	6	5	6	6	5	7	5	6	5	7
05	60	3	8	6	8	4	6	7	7	4	7
06	60	6	7	5	6	5	6	5	7	6	7
07	62	1	8	7	7	7	5	7	7	6	7
08	34	0	6	2	5	2	4	3	5	2	5
09	45	2	4	5	5	5	4	6	5	6	3

APPENDIX D - continued

RAW SCORES OBTAINED

Institution D.

Raw Scores - Subject Areas*

ID No.	Raw Score	ENVI	COM HEA	DIS	NUT	PHY FT	FAM LIFE	CONS HEA	MEN	DRUGS	SAFE
10	46	3	5	3	4	3	5	5	7	5	6
11	45	3	6	6	4	4	5	6	4	3	4
12	46	2	5	5	5	3	4	6	6	6	4
13	47	2	5	6	6	4	3	4	5	4	8
14	47	2	7	5	2	5	5	3	8	4	6